

# Improvements in Productivity in Textile Industry through TQM Implementation

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**Abstract-** *Total Quality Management improves customer satisfaction and employee involvement. The productivity is improved through implementation of TQM. This study is carried out to analyse the expectations on improvements in productivity through implementation of TQM in textile industry. It also studies the benefits and constraints related to TQM implementation. The study follows descriptive design using primary data collected through questionnaire from a sample of employees. The data analysis was done using percentages and statistical test. It was found that the employees strongly suggested implementation of TQM tools including 5S, Kaizen, Six Sigma, 7 QC tools, Quality Circle etc.*

**Key words-** Total Quality Management, Chi Square Test, Quality Circle, 5S, Kaizen, Six Sigma

## INTRODUCTION

Total Quality Management, TQM, is a method by which management and employees can become involved in the continuous improvement of the production of goods and services. TQM views an organization as a collection of processes. It maintains that organizations must strive to continuously improve these processes by incorporating the knowledge and experiences of workers. The simple objective of TQM is “Do the right things, right the first time, every time.” TQM is infinitely variable and adaptable. Although originally applied to manufacturing operations, and for a number of years only used in that area, TQM is now becoming recognized as a generic management tool, just as applicable in service and public sector organizations. There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor.

Total Quality Management (TQM) is a management approach that originated in the 1950s and has steadily

become more popular since the early 1980s. Total quality is a description of the culture, attitude and organization of a company that strives to provide customers with products and services that satisfy their needs. The culture requires quality in all aspects of the company’s operations, with processes being done right the first time and defects and waste eradicated from operations.

In India, the Textile Industry has got an important place. It has a great contribution to the economy of the country. It also contributes to the industrial output, employment generation and foreign exchange earnings. The value addition in the manufacturing sector is 20% and the contribution to GDP is from 4 to 5% and export earnings by the Textile industry in India is more than 30% of the total export.

The study on Improvement of Productivity through TQM is conducted at Anna Co Operative Spinning Mills Limited. It is a Co operative society owned by the government. This company belongs to Textile Industry.

The Anna Co-operative Spinning Mill Ltd., is one of the eighteen Co-operative Spinning Mills in Tamil Nadu. It was registered on 22<sup>nd</sup> February 1982 and their commercial production was started on 6<sup>th</sup> June 1984. It had the licensed capacity of 25000 spindles. The mill was situated about 42.86 acres land. It requires raw material about 1500 bales per month (each 170 kgs). The raw cotton is purchased from local areas and from Tamil Nadu Co operative Spinning mills Federation, Chennai.

The mill produces various types of yarn. Some of them are cone yarn, hank yarn, polyester yarn etc. most of the yarn produced in the mill is supplied to co-optex yarn units at the rate fixed by the director of handlooms and textile, Chennai.

RESEARCH PROBLEM

TQM is a combination of quality and management tools aimed at increasing business and reducing losses due to wasteful practices. So, the study is aimed at improvement of productivity through application of Total Quality Management. Anna Co-operative Spinning Mills purchases raw material from Tamil Nadu itself. They produce various types of yarn. The research is conducted on the selection of raw materials and quality of they are produced.

The objectives of the study include: To analyse the possibility of implementation of TQM in the company, to analyze the constraints and benefits of implementing TQM in the company.

The hypotheses of the study were:

- Null Hypothesis (H<sub>0</sub>): There is no significant relationship between implementation of TQM and improvements in productivity.
- Alternate Hypothesis (H<sub>1</sub>): There is a significant relationship between implementation of TQM and improvements in productivity.

The limitations include: the limited time of two months and limited data availability.

RESEARCH METHODOLOGY

The study used a descriptive design. The data used by the study include primary and secondary data. The primary data is collected from the employees, managers through the distribution of questionnaires. The secondary information was collected from books, journals, thesis, company websites, etc. The population of the study includes all employees of the company which is a total of 443. Simple random sampling was used to select a sample of 70. Percentages are used for analysis and Chi Square Test is used to test whether there is a relationship between the improvement in productivity and TQM.

ANALYSIS

Using the data collected, the analysis is conducted using percentages.

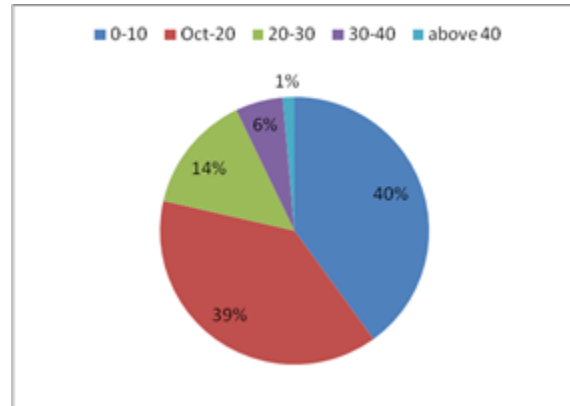
1. The age group distribution of respondents is given below.

Table 1: Age Group of Respondents

Age group	Respondents	Percent
25-30	16	23%
30-35	17	24%
35-40	15	22%
40-45	17	24%
ABOVE 45	5	7%

25-30	16	23%
30-35	17	24%
35-40	15	22%
40-45	17	24%
ABOVE 45	5	7%

Figure 1: Age Group of Respondents



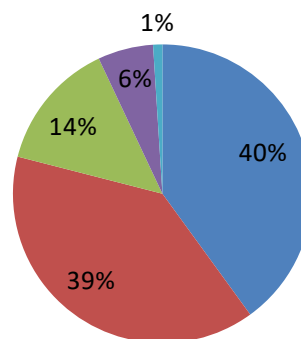
In this organization most of the employees are in the age group of 30-35 and 40-45.

2. The years of experience distribution of respondents is given below.

Table 2: Experience of Respondents

Option	Respondents	Percent
0-10	28	40%
10-20	27	39%
20-30	10	14%
30-40	4	6%
> 40	1	1%

Figure 2: Experience of Respondents



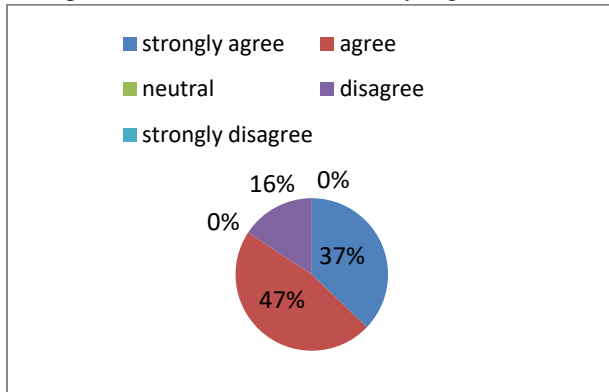
Most of the employees have an experience of 0-10 years and only one person have the experience of more than 40 years.

3. The respondents' opinion on whether TQM has an important role in the success of any organization is given below.

Table 3: Respondents' opinion on whether TQM has an important role in the success of any organization

Option	Respondents	Percent
Strongly Agree	26	37%
Agree	33	47%
Neutral	0	0%
Disagree	11	16%
Strongly Disagree	0	0%

Figure 3: Respondents’ opinion on whether TQM has an important role in the success of any organization



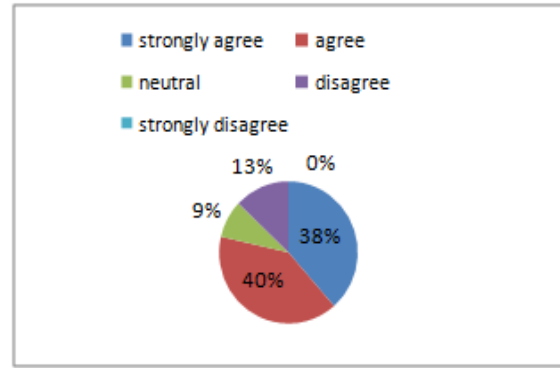
TQM has an important role in the success of an organization because it aims at customer satisfaction and helps to reduce the cost and wastage of the organization. Due to this, 47% of the respondents agreed to this. Also, TQM provides the quality assurance that the customers will get what they expect. There is a process for managing unsatisfied customers, make corrections and prevent similar reoccurrences. It helps the business to look within and understand its operations and focus on internal process. As a result of this TQM is about how the whole organization operates to understand customer expectations and competitively deliver customer satisfaction.

4. The respondents’ opinion on whether TQM helps to improve teamwork is given below.

Table 4: Respondents’ opinion on whether TQM helps to improve teamwork

Option	Respondents	Percent
Strongly Agree	27	38%
Agree	28	40%
Neutral	6	9%
Disagree	9	13%
Strongly Disagree	0	0%

Figure 4: Respondents’ opinion on whether TQM helps to improve teamwork



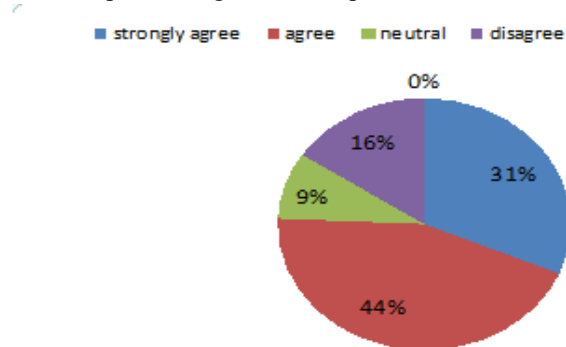
Teamwork enables to employees to accomplish task faster and more efficiently than tackling projects individually. It is also important in an organization because it provides employees with an opportunity to bond with one another, which improves relationship among them. By implementing TQM there can be an increase in the work efficiency, employee relationships and employee accountability. Teamwork also enhances cooperative learning opportunity to the employees. As a result of this 40% of the employees are saying that TQM will improve the teamwork of employees

5. The respondents’ opinion on whether TQM has direct impact on organizations’ performance is given below.

Table 5: Respondents’ opinion on whether TQM direct impact on organizations’ performance

Option	Respondents	Percent
Strongly Agree	22	3%
Agree	31	41%
Neutral	6	9%
Disagree	11	16%
Strongly Disagree	0	0%

Figure 5: Respondents’ opinion on whether TQM direct impact on organizations’ performance



TQM implementation has been an important aspect for improving organizational efficiency. TQM focus on continuous process improvement within organizations

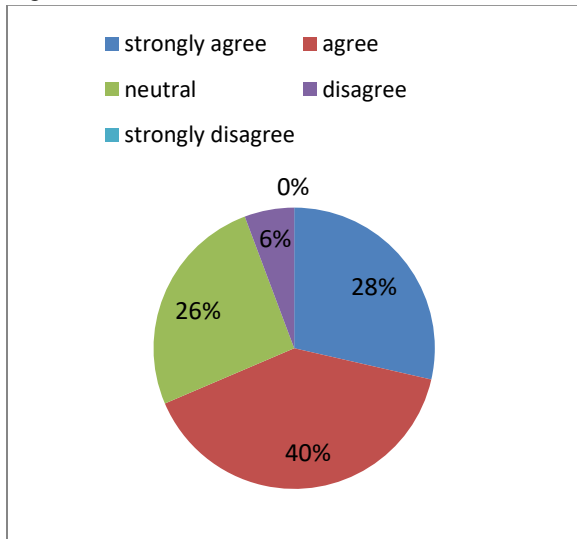
to provide superior customer value and meet customer needs. It also provides a proper managerial guideline for organizational management to adopt and develop strategies for the organizations. Therefore 41% of the employees are agreeing that TQM has direct impact in organization performance.

6. The respondents' opinion on whether ISO certification provides any benefits to their organization is given below.

Table 6: Respondents' opinion on whether ISO certification provides any benefits to their organization

Option	Respondents	Percent
Strongly Agree	20	28%
Agree	28	40%
Neutral	18	26%
Disagree	4	6%
Strongly Disagree	0	0%

Figure 6: Respondents' opinion on whether ISO certification provides any benefits to their organization



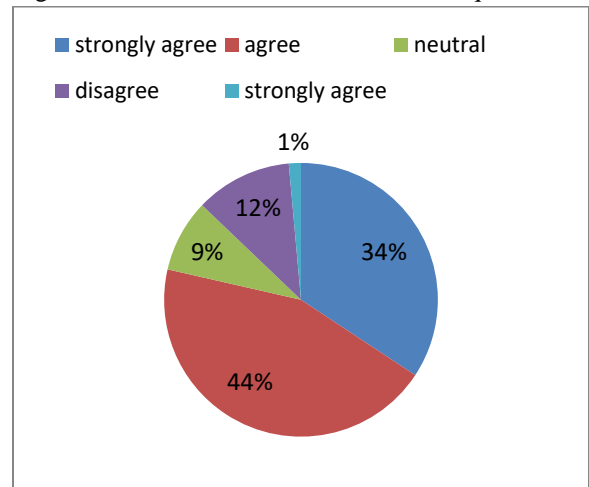
International Organization for Standardization (ISO) is developed to promote the international standards to facilitate free exchange of goods and services across the globe. ISO helps to build customer confidence by delivering product and service of desired quality. This enhances improved work efficiency, reduction in scrap and re-works. As a result of these factors 40% of the employees agree that ISO certification provides benefits to the organization

7. The respondents' opinion on whether QFD (Quality Function Deployment) is very essential for an organization to understand the customer requirements is given below.

Table 7: Respondents' opinion on whether QFD (Quality Function Deployment) is very essential for an organization to understand the customer requirements

Option	Respondents	Percent
Strongly Agree	24	35%
Agree	31	45%
Neutral	6	9%
Disagree	8	11%
Strongly Disagree	1	1.42%

Figure 7: Respondents' opinion on whether QFD (Quality Function Deployment) is very essential for an organization to understand the customer requirements



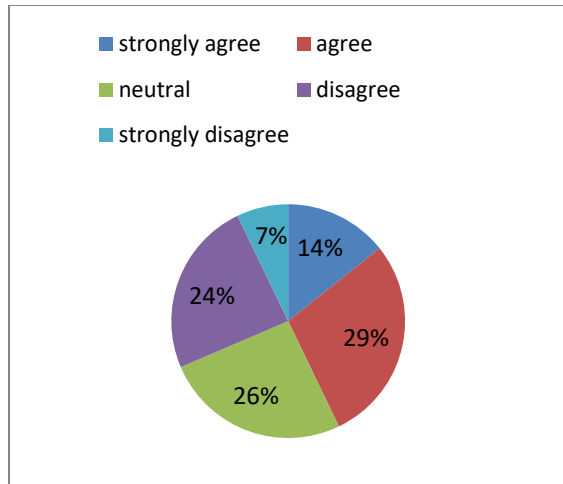
Quality Function Deployment is a quality assurance method that would design customer satisfaction into a product before it was manufactured. It can address major issues and customer complaints, deeper understanding the customers and reduced chance of oversights during the design process. It also helps make quick changes and revisions. By understanding these benefits 40% of the respondents are agreeing that QFD is very essential for an organization to understand the customer needs.

8. The respondents' opinion on whether TQM ensures efficient use of available resources is given below.

Table 8: Respondents' opinion on whether TQM ensures efficient use of available resources

Option	Respondents	Percent
Strongly Agree	10	14%
Agree	20	29%
Neutral	18	26%
Disagree	17	24%
Strongly Disagree	5	7%

Figure 8: Respondents' opinion on whether TQM ensures efficient use of available resources



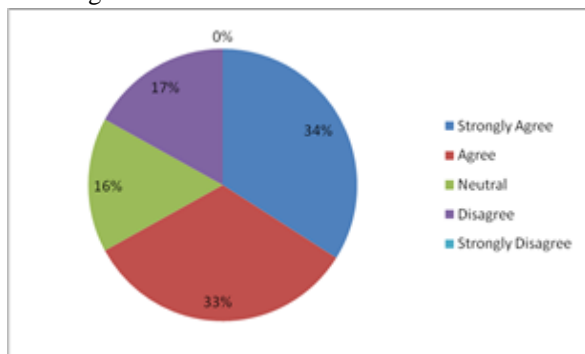
TQM ensures efficient use of available resources because it ensures overall development of organization. For that the organization should give more importance to the resources and the optimum utilization of these resources. Because of the efficient use resources, the organization can increase the profitability and productivity. As a result of this, 29% of the respondents agree that it ensures efficient use of available resources.

9. The respondents' opinion on whether applying KAIZEN principle ensures continuous improvement in an organization is given below.

Table 9: Respondents' opinion on whether applying KAIZEN principle ensures continuous improvement in an organization

Option	Respondents	Percent
Strongly Agree	24	34%
Agree	23	33%
Neutral	11	16%
Disagree	12	17%
Strongly Disagree	0	0%

Figure 9: Respondents' opinion on whether applying KAIZEN principle ensures continuous improvement in an organization

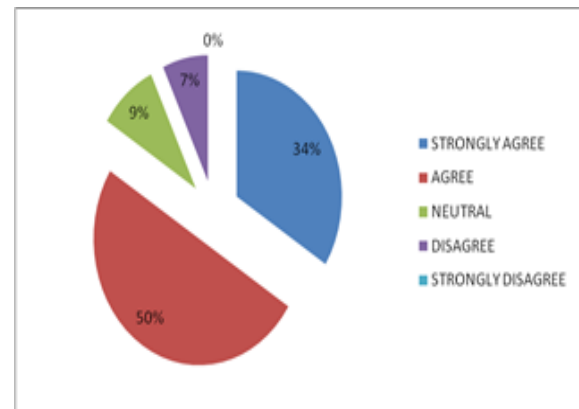


Kaizen principle means ensures continuous improvement by problem solving in the organization. Its effects are felt on long term basis. Introduction of Kaizen and direction are to be top-down where the suggestions are bottom-up. Best suggestions come from the person closest to the problem. It brings continuous improvement of the products by reducing the problem and ends with the standardization of product. As a result of this 40% of the respondents are strongly agreeing that application of kaizen principle in an organization can ensures continues improvement and there is no strongly disagreeing respondents to this. 10. The respondents' opinion on whether TQM is helpful for meeting the quality requirements of customers is given below.

Table 10: Respondents' opinion on whether TQM is helpful for meeting the quality requirements of customers

Option	Respondents	Percent
Strongly Agree	24	34%
Agree	35	50%
Neutral	6	9%
Disagree	5	7%
Strongly Disagree	0	0%

Figure 10: Respondents' opinion on whether TQM is helpful for meeting the quality requirements of customers



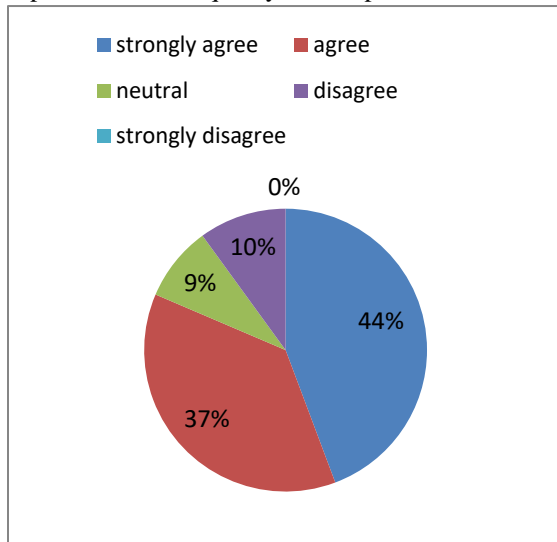
The customers make the ultimate evaluation of the quality. Top management must provide leadership and support for all quality initiatives. TQM ensures organization wide improvement through involvement of everyone. Therefore the organization should be able to meet the quality requirements of the customers. It is visible in the graph that 50% of the respondents are agreeing to this.

11. The respondents' opinion on whether TQM helps to reduce the quality related problems is given below.

Table 11: Respondents' opinion on whether TQM helps to reduce the quality related problems

Option	Respondents	Percent
Strongly Agree	31	44%
Agree	26	37%
Neutral	6	9%
Disagree	7	10%
Strongly Disagree	0	0%

Figure 11: Respondents' opinion on whether TQM helps to reduce the quality related problems



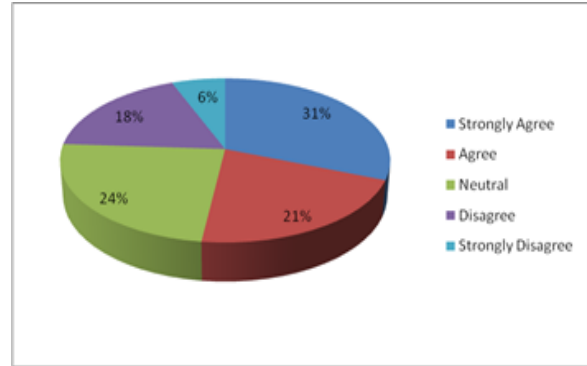
TQM has a strong emphasis on improving quality within a process, rather than inspecting quality in to a process. This not only reduces the time needed to fix errors, but also makes it less necessary to employ a team of quality assurance personnel. As a result of these factors 44% of the respondents strongly agreed that TQM helps to reduce the quality related problems of an organization.

12. The respondents' opinion on whether Quality Circle brings changes in employee's attitude is given below.

Table 12: Respondents' opinion on whether Quality Circle brings changes in employee's attitude

Option	Respondents	Percent
Strongly Agree	19	31%
Agree	13	21%
Neutral	15	24%
Disagree	11	18%
Strongly Disagree	4	6%

Figure 12: Respondents' opinion on whether Quality Circle brings changes in employee's attitude



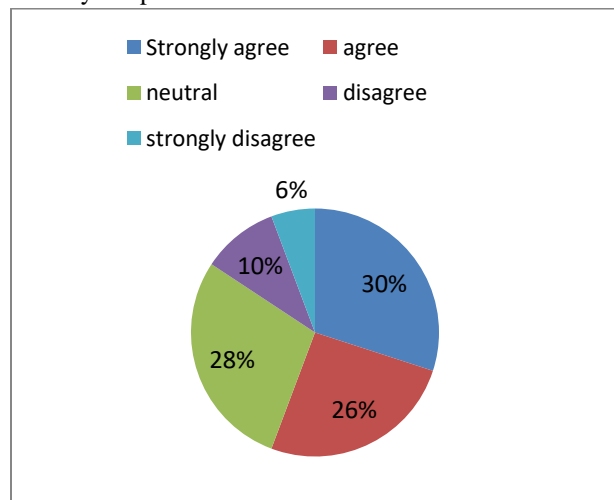
The main objective of Quality Circle is to utilize human resources effectively, develop quality products, improves quality of work life and utilizes an individual's creative abilities. The main focus of this principle is analyzing work related problems leading improvement in their total performance and enrichment of work life. There by the employees will get a relief from the work related problems and can change their attitude. As a result, 31% of the respondents strongly agree with this statement.

13. The respondents' opinion on whether by implementing 7 QC Tools the organization can identify the problems is given below.

Table 13: Respondents' opinion on whether by implementing 7 QC Tools the organization can identify the problems

Option	Respondents	Percent
Strongly Agree	21	30%
Agree	18	26%
Neutral	20	28%
Disagree	7	10%
Strongly Disagree	4	6%

Figure 13: Respondents' opinion on whether by implementing 7 QC Tools the organization can identify the problems



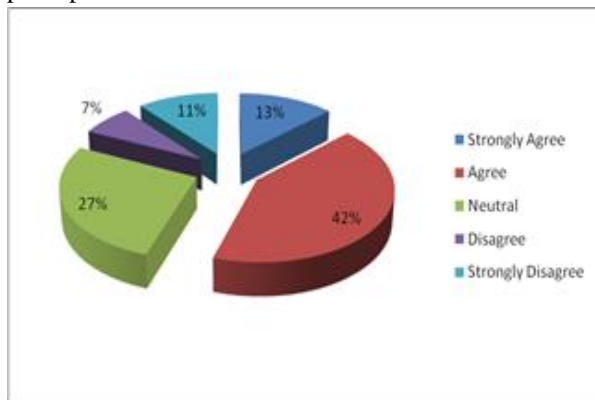
There are 7 QC Tools to analyze and resolve the work related problems leading to improvement in employees' total performance and enrichment of employee welfare. Every organization should understand and resolve the problems of employees so that they can ensure quality. The 7 QC tools include the Check Sheets, Pareto Charts, Cause and Effect Diagram, Histograms, Scatter Diagram and Flow Chart. All this tools help to identify the work related problems of the employees. Due to this reasons 30% of the employees strongly agree that 7 QC tools can identify the problems of the organization.

14. The respondents' opinion on whether organization can build its culture by using the 5S principles is given below.

Table 14: Respondents' opinion on whether organization can build its culture by using the 5Ss principles

Option	Respondents	Percent
Strongly Agree	7	13%
Agree	23	42%
Neutral	15	27%
Disagree	14	7%
Strongly Disagree	6	11%

Figure 14: Respondents' opinion on whether organization can build its culture by using the 5Ss principles



5S principle is a culture that has to be built in an organization for improvement of quality. This principle ensures structuring, systematization, sanitation, standardization and self discipline. By implementing this principle the organization can built a culture. Through they can ensure the quality of the products also. This is why 42% of the respondents agree that 5S principles built a culture to the organization.

15. The respondents' opinion on how does the organization solve quality related problems is given below.

Table 15: Respondents' opinion on how does the organization solve quality related problems

Method	Respondents	Percent
Assign individuals to solve	0	0%
Set up multi-disciplinary team	70	100%
Permanent team is available	0	0%
Others if any specify__	0	0%

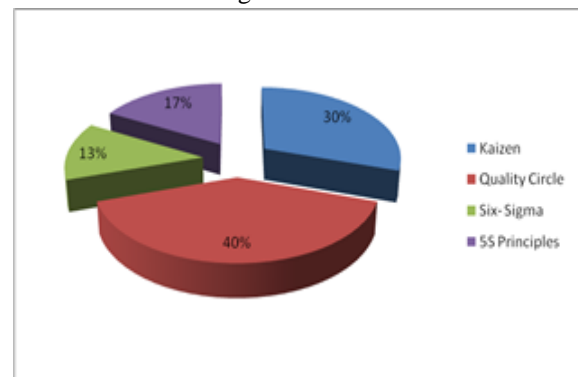
In this organization they had set up a multi disciplinary team to solve the quality related problems. In Multi disciplinary team the members are already selected and they take care about the quality related problems and should be able to find out necessary temporary solutions to the problem.

16. The respondents' opinion on which TQM tool is beneficial to the organization is given below.

Table 16: Respondents' opinion on which TQM tool is beneficial to the organization

Tool	Respondents	Percent
Kaizen	21	30%
Quality Circle	28	40%
Six- Sigma	9	13%
5S Principles	12	17%

Figure 15: Respondents' opinion on which TQM tool is beneficial to the organization



TQM ensures total improvement to the whole organization. For that TQM has many tools like Kaizen, Quality Circle, Six Sigma, 5S principles. According to the study, 30% of the employees are supporting Kaizen, 40% of the employees are supporting Quality Circle, 13% are supporting to Six Sigma and 17% are supporting to 5S principles. More people are supporting Quality Circle because it involves participative management, problem solving techniques and organizational culture of team spirit

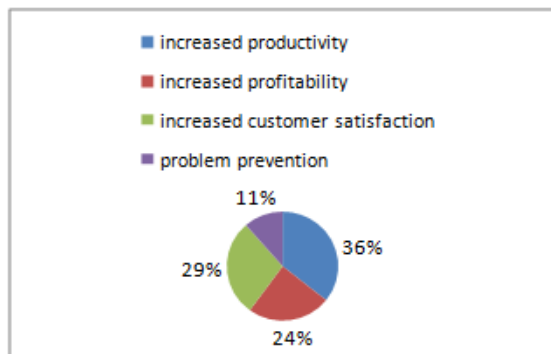
and self development. As compared to other tools implementation of QC is easier.

17. The respondents' opinion on expected benefits for the organization after implementing TQM is given below.

Table 17: Respondents' opinion on expected benefits for the organization after implementing TQM

Benefit	Respondents	Percent
Increased productivity	25	36%
Increased profitability	17	24%
Increased customer satisfaction	20	29%
Problem prevention	8	11%

Table 16: Respondents' opinion on expected benefits for the organization after implementing TQM



TQM means an effort of continuous quality improvement of all process, products and services through universal participation that results in increased customer satisfaction, loyalty, and improved business results. According to the survey 36% of the respondents are saying that implementing TQM will increase productivity, 24% of the respondents are saying that TQM will increase profitability, 29% of the respondents are saying that TQM will increase customer satisfaction and 11% of the respondents says that TQM will prevents problems. So, there expected benefit after implementing TQM is increased productivity and it can be achieved using proper implementation of TQM tools.

**Hypothesis Testing**

The Chi-Square test is used because the sample size is small and the population standard deviation is unknown. The p value is calculated with the help of excel software. H<sub>0</sub> is tested at a 5% level of significance

- Null Hypothesis (H<sub>0</sub>): There is no significant relationship between implementation of TQM and improvements in productivity.

- Alternate Hypothesis (H<sub>1</sub>): There is a significant relationship between implementation of TQM and improvements in productivity.
- Chi- Square Calculated Value =  $\sum [(O-E)^2/E] = 27.17$
- Degrees of freedom = (r-1)(c-1) = 9
- The level of significance is 0.05
- Tabulated value of Chi- Square for 9 Degrees of Freedom at 5% Level of Significance is 16.919
- As the Calculated value > Tabulated value, H<sub>0</sub> is rejected. H<sub>1</sub> is accepted. Thus, there is a significant relationship between implementation of TQM and improvements in productivity.

**FINDINGS**

The findings from the study are given.

- In this organization most of the employees are in the age group of 30-35 and 40-45.
- In this organization more employees have an experience of 0-10years.
- The organization has a complete process of production within the organization.
- 47% of the respondents are saying that TQM has an important role in the success of an organization where as 16% are disagreeing to this.
- 40% of the respondents are saying that TQM helps to improve he team work in an organization because it helps to improve the employee relationship, work efficiency and work accountability.
- 41% of the respondents are saying that there should be direct impact of TQM in the organizations performance because it focuses on the continuous improvement of customer needs and adds superior values to the customer needs.
- 40% of the respondents are saying that ISO certification provides benefits to the organization because it ISO helps to build customer confidence by delivering product and service of desired quality.
- 45% of the respondents are saying that for understanding the customer requirements qfd (Quality Function Deployment) is very essential for an organization because would design customer satisfaction into a product before it was manufactured.



- 29% of the respondents are saying that TQM ensures efficient use of available resources because it ensures overall development of organization.
- 34% of respondents are strongly agreeing that the by applying kaizen principle the organization can ensure continuous improvement because it ensures continuous improvement by problem solving in the organization. Its effects are felt on long term basis.
- 50% of the respondents agree that the TQM is helpful for meeting the quality requirements of customers because the customers make the ultimate determination of the quality.
- 44% are strongly agreeing that TQM helps to reduce the quality related problems because it makes less necessary to employ a team of quality assurance personnel.
- 31% of respondents are strongly agreeing that quality circle brings a change in employee's attitude because it helps in analyzing work related problems leading improvement in their total performance and enrichment of work life.
- 28% of the respondents are strongly agreeing that by implementing 7 quality circle tools the organization can identify the problems because it helps to analyze and resolve the work related problems.
- 42% of the respondents say that the organization can build its culture by 5S principles.
- 100% of the employees are saying that using multi disciplinary team they can solve the quality related problems.
- 40% of the respondents are saying that quality circle is the most beneficial TQM tool that can be implemented in the organization.
- 36% of the respondents are saying that expected benefits for the organization after implementing TQM.
- There is a significant relationship between implementation of TQM and the improvements in productivity.
- The company needs to ensure proper maintenance and working of the machines.
- The company needs to encourage coordination among departments and employees.
- Sustained commitment of top management is needed for TQM.
- The company needs to provide proper trainings and rewards for the employees.
- They can apply the Kaizen principles to improve the quality.
- They can use 7 QC tools to control the quality.
- They can adopt preventive maintenance to ensure proper working of machines.
- They can adopt necessary to improve service quality.
- Proper quality of raw material need to be ensured before sending it to the production department.
- Coordination and communication are to be improved among departments and employees.
- Frequent breakdowns of machines can be reduced by implementing preventive maintenance system.
- Capacity utilization can be improved.
- The employees are suggesting that the TQM has an important role to play in the success of an organization. So, TQM can be implemented in the organization.
- Quality circle can be implemented in the organization as a TQM tool to increase the productivity.
- Organization can set up a multi disciplinary team to solve the quality related problems.
- The organization can use 5S principle to build its culture.
- Quality circle helps to change the employee attitudes.
- The organization can ensure a continuous improvement by applying the kaizen principle.

### SUGGESTIONS

Some suggestions are provided.

- The company needs to adopt updated technologies to improve quality.

### CONCLUSION

Total Quality Management means quality of output of every department and by every employee. It includes cleanliness, orderliness, punctuality, customer service, and standardization of activities and continuous efforts for their improvement. The needs of the customers are constantly monitored to improve the products and processes to meet their requirements. This study is

done Anna Co-operative Spinning Mills, Theni to analyse various attitudes of employees on TQM implementation in that organization and to study various benefits and problems of implementation. The success of TQM is measured not only by its tangible outcome but also by both the way in which the organizational structure is established and the processes by which corporate objectives are achieved.

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